Glyceria maxima: biological, environmental and chemical assessments

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Gertie Arts, Maria Paula Yoshii, Dick Belgers and Marie-Claire Boerwinkel
Biological, environmental and chemical assessments: which

- Shoot height;
- Leaf length;
- N leaves and shoots;
- Visual assessment root health and plant health;
- FW and DW;
- pH and \( \text{O}_2 \);
- Analytical verification.

All assessments aboveground (except for root health)

Courtesy of Syngenta
## Biological and chemical assessments: when

<table>
<thead>
<tr>
<th>Day</th>
<th>Representative plants</th>
<th>Test plants</th>
<th>Test plants</th>
<th>Test plants</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>A</td>
</tr>
<tr>
<td>7</td>
<td>-</td>
<td>-</td>
<td>A</td>
<td>-</td>
</tr>
<tr>
<td>14</td>
<td>-</td>
<td>-</td>
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</tbody>
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A = assessment required on this occasion  
- = assessment not required on this occasion  
SH = Shoot Height  SFW = Shoot Fresh Weight  
LL = Leave Length  SDW = Shoot Dry Weight  
SN = Number of Shoots  LN = Leave Number

**Draft Glyceria protocol**
Biological and chemical assessments: how

- How to perform the biological and chemical assessments will be shown in the next slides;
- First of all it is important to understand the growth form of *Glyceria maxima*.
Glyceria maxima

Growth form

Mother shoot

Daughter shoot (young shoot)

Root stock

Root
**Glyceria maxima**

Leaf

Sheath
Glyceria maxima

Ligule
Measuring shoot height (SH)

• Shoot height is defined as the distance from soil surface to shoot tip;
• Recorded at planting and immediately prior to test initiation, i.e. day 0.
Measuring leaf length (LL)

• Leaf length is determined using a ruler.
• The length of the leaf is measured from the basis of the ligule to the leaf tip.
• In the case of unfolded leaves, length should be measured from the point of emergence from the shoot to the leaf tip.
• The length of all leaves on all shoots should be recorded and then summed to give a total leaf length per pot.
Glyceria maxima: number of leaves

• The number of leaves on each shoot should be recorded and then summed to give a total leaf number per pot;
• All leaves of which leaf length and biomass can be measured, need to be assessed.
All measurable endpoints need to be assessed

- Weights and lengths should be assessed as long as they are measurable, including e.g. dry or brown leaves;
- With the experimental set-up of one single shoot per pot that meets the initial selection criteria, it is highly unlikely that a plant will become unmeasurable within 14 days;
- Only fluffy, algae overgrown.
Glyceria maxima: number of shoots

Number shoots

New shoot
Measuring pH, O2, T and conductivity
Glyceria maxima sampling and washing
Glyceria maxima sampling and washing
Glyceria maxima FW and DW
Glyceria maxima:

aboveground biomass

Aboveground biomass

Belowground biomass
Glyceria maxima: visual assessment of plant health

• Need for qualitative observations of symptoms relative to control plants such as chlorosis, necrosis, growth deformities, discoloration such as excessive reddening, growth abnormalities such as stunting, distorted shoots/leaves.

• Development of bacterial or algal contamination in the media needs to be reported;

• Control plants must be visually healthy and not show any visible symptoms of chlorosis;

• Visual assessments of root health on day 0 and 14;

• Visual assessment of plant health at day 14.

• The entire contents of a pot should be considered to give a single value / assessment per pot.
Glyceria maxima: visual assessment

Healthy plant

Necrosis of leaf

Necrosis of complete plant

Chlorosis and reddening

Necrosis of leaf

Necrosis of complete plant

Courtesy of WUR

Courtesy of BASF
Chemical sampling and analysis

- Water samples should be collected at days 0, 7 and 14 for analyses of test substance concentration;
- Prepare the concentrations in bulk per treatment and take samples from the bulk solution for chemical analysis at day 0;
- Pool samples from the different treatments at days 0, 7 and 14;
- It is preferred to take analytical samples from each test vessel.
Thank you very much for your attention!